



**AN ASSESSMENT OF GROWTH, DISTRIBUTION
AND POVERTY IN EGYPT: 1990/91-2004/05**

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Abstract

The purpose of this paper is to explain observed growth over the period 1990/91-2004/05 and to determine whether it has been associated with improved distribution leading to a significant reduction in poverty; or whether growth has been combined with deteriorating income distribution, dampening or even reversing the growth effect on poverty. The analysis proceeds along three levels: *the macroeconomic level*, which considers the growth experience of Egypt over the past fifteen years; *the sectoral level*, which addresses the pattern of growth of various sectors of activity as well as the poverty levels in these sectors; and finally *the household level*, which studies the pattern of distribution and poverty indicators for various expenditure groups. In light of the analysis, the paper stresses that economic growth alone is not sufficient to achieve the goal of poverty reduction; countries that have combined rapid growth with improved income distribution have reduced poverty the fastest. To conclude, the paper highlights specific policies and strategies that would simultaneously lead to high and sustained GDP growth, more equitable distribution and a rapid reduction in poverty.

ملخص

يحاول هذا البحث تفسير النمو الذي شهدته التجربة المصرية في الفترة الممتدة من أوائل التسعينيات من القرن العشرين حتى الآن وعلاقته بتطور الفقر خلال تلك الفترة، وذلك لتحديد إن كان النمو قد صاحبه أيضا عدالة في التوزيع ليؤدي كلاهما إلى انخفاض الفقر، أو على العكس إن كان صاحبه تدهور في توزيع الدخل يلغي ما كان النمو قد حققه في معالجة الفقر أو حتى أدى إلى زيادة الفقر. ويتم إجراء التحليل على ثلاثة مستويات: أولاً، مستوى الاقتصاد الكلي، الذي يتتبع مسار النمو في مصر على مدى الخمسة عشرة عاماً الماضية؛ ثانياً، المستوى القطاعي، الذي يتناول أنماط النمو في القطاعات المختلفة ومستويات الفقر في هذه القطاعات؛ وأخيراً، مستوى القطاع العائلي، الذي يبحث نمط التوزيع ومؤشرات الفقر لمختلف مجموعات الإنفاق. وفي ضوء التحليل، تؤكد الورقة على أن النمو الاقتصادي وحده غير كافي لتحقيق هدف الحد من الفقر؛ فالبلدان التي جمعت بين النمو السريع وتحسين نمط توزيع الدخل هي التي تمكنت على نحو أسرع من تقليص معدل الفقر. وفي النهاية، تلقي الورقة الضوء على السياسات والإستراتيجيات التي من شأنها أن تؤدي إلى النمو المرتفع والمستدام في الناتج المحلي الإجمالي، والمقترن بتوزيع أكثر عدالة في الدخل وتخفيض سريع في مستوى الفقر.

1. INTRODUCTION

A prime goal of development efforts is to reduce poverty; and to fulfill that goal requires strong, country-specific combinations of growth and distribution policies (Bourguignon 2005). Countries that have combined rapid growth with improved income distribution have reduced poverty the fastest. It has been pointed out that the "quantity and quality of employment of the poor" is a crucial factor in determining how growth would translate into higher income for the poor (Osmani 2003, as quoted in El-Laithy and El Ehwany forthcoming). However, when policies aimed at equity have had a negative effect on growth, the poverty reduction impact has been limited or even negative. Similarly, when growth has been combined with deteriorating income distribution, the poverty reduction impact has also been limited or negative. Thus, investigating the relative importance of growth and inequality factors may be helpful when trying to strike the right balance between equity and pro-growth interventions.

Based on the Egyptian experience since the beginning of the 1990s¹ to date, this paper tries to explain the observed growth in Egypt and to link it to the evolution of poverty over this period, in an attempt to identify whether growth has been associated with improved distribution so that they both would lead to a significant reduction in poverty or, conversely, whether growth has been combined with a deterioration in income distribution dampening or even reversing the growth effect on poverty reduction. The period of study has been further divided into three sub-periods corresponding to the time elapsed between the four successive household, income, expenditure and consumption surveys available for the whole period. The analysis proceeds along three levels of aggregation: the *macroeconomic level* which considers the growth experience of Egypt over the past fifteen years; *the sectoral level* which addresses the pattern of growth of various sectors of activity as well as the poverty levels in these sectors; and finally the *household level*, which studies the pattern of distribution and poverty indicators for various expenditure groups.

The analysis is based on time series and cross-sectional data from Egyptian sources complemented with international sources. The figures for macroeconomic and sectoral GDP and employment are obtained from the Ministry of Economic Development (MOED). Capital

¹ The year 1990/91 has been chosen as the initial year of the analysis as it marked a turning point in Egypt's modern economic history with the initiation of the economic reform and structural adjustment program. The program aimed at eliminating macroeconomic imbalances and redressing economic inefficiencies resulting from costly economic policies and institutional deficiencies of the previous decades.

stock is derived from Nehru and Dhareshwar dataset (Nehru and Dhareshwar 1993) and the World Bank database. Distribution and poverty measures are calculated from four successive household income, expenditure and consumption surveys (HIECS) for the years starting 1990/91 to 2004/05² implemented by the Central Agency for Public Mobilization and Statistics (CAPMAS).

The paper is organized as follows: after this introduction, Section 2 discusses some key features of the macroeconomic growth experience. Section 3 investigates aggregate poverty trends in Egypt and discusses growth and distribution components of poverty measures. Section 4 analyses the sectoral patterns of GDP and employment growth and tries to correlate these observed patterns with income distribution and poverty. Section 5 highlights policy requirements of equitable growth. Section 6 concludes.

2- KEY FEATURES OF EGYPT'S GROWTH

2.1. GDP Growth (1990/91–2004/05)

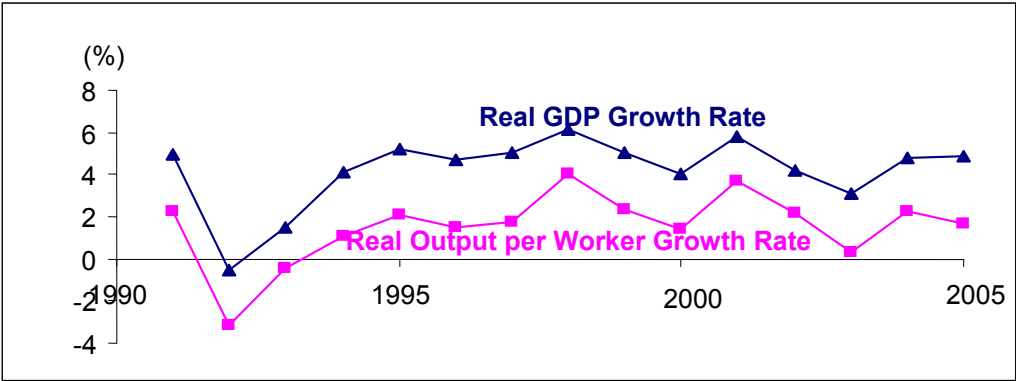
During the period considered, the annual rate of real GDP growth averaged 4.2 percent. The growth of GDP was characterized by frequent fluctuations around the average with values ranging between a minimum of -0.503 percent in 1991/92 and a maximum of 6.15 percent in 1997/98, with a standard deviation of 1.71 percent.

After the sharp decline in 1991/92 following the stabilization effort to address the serious internal and external imbalances that Egypt was facing, the reform program managed to reduce these macroeconomic imbalances and to establish conditions for sustainable growth. The growth rate of GDP picked up in 1994/95 to reach a peak exceeding 6 percent in 1997/98 as shown in figure 1. This growth could be attributed to the increase in private investments, largely inventory accumulation rather than gross fixed capital formation and public investments mainly in infrastructure mega projects. The Egyptian economy has then been confronted with several external shocks. Since 1998/99, the growth rate started to decline due to the combined effect of three external shocks: the emerging market crises, the Luxor incident and the sharp decline in oil prices in 1998, in addition to the *lax economic structural reform efforts*. This was followed by the global economic fallout from the September 11 attacks in 2001. The situation was further aggravated by the war on Iraq, the consequent

² The years indicated here and thereafter refer to fiscal years which start July 1st and end June 30th of the next year. The four surveys have been implemented for 1990/91, 1995/96, 1999/2000 and 2004/05.

uncertain political conditions in the region and the sluggish global environment. This slowdown was evident in real sector indicators and in privately conducted business surveys (ERF and FEMISE2 2004, pp.11-12).

Figure 1. Real GDP and Output per Worker Growth Rates (1990/91– 2004/05)* (%)



Source: MOED and WDI Database and authors' calculations.
 * Years indicated in the figure refer to fiscal years. Thus 2000 refers to fiscal year 1999/2000 starting July 1st 1999 and ending June 30th 2000 and so on.

The slowdown continued in 2001/02, approaching 4.3 percent. Economic activity in 2002/03 remained constrained by a shortage of foreign currency, inactive monetary policy, high real interest rates, and a depressed regional and global environment. In January 2003, the Egyptian pound was floated, resulting in a depreciation of its value exceeding 30 percent. Real GDP growth rate declined further to around 3 percent, which is far below the Egyptian economy's potential and what is required to reduce the unemployment rate and to provide job opportunities to the new entrants to the labor market. Inflation accelerated. However growth exceeded 4.7 percent in 2003/04, reached around 5 percent during 2004/05 and is projected to exceed 6 percent by the end of 2005/06 and the beginning of the following year. The recovery has been driven by a rebound in tourism, increased exports of goods and services, a moderate revival in consumption expenditures and a continuing fiscal expansion associated with a widening budget deficit. Private consumption and investment are expected to further strengthen as personal and corporate tax rates are lowered (UNDP and INP 2005, pp.86-87).

2.2. Sources of Output Per Worker Growth: Capital Intensity and Total Factor Productivity

The standard neoclassical growth accounting presumes two potential sources of growth of GDP or aggregate output. The first is explained by the growth of physical inputs used in production. The second is an unobserved residual after accounting for inputs growth. This

residual growth (called the Solow residual) is taken to represent gains in output due to improvements in technological efficiency with which physical inputs are utilized, it is defined as total factor productivity (TFP). Such residuals include the effects of factors affecting the motivation of workers, the productivity of capital, levels of education, health and living standards of members of the society, efficiency in resource allocation and the acquisition and application of modern technology. It would also contain measurement and unknown statistical errors in output or input data.

Using a linearly homogeneous Cobb-Douglas production function with Hicks-neutral technical progress and two factor inputs, labor and capital (see Appendix 1) and assuming a depreciation rate of 5 percent per year, the share of capital α , or elasticity of output with respect to capital, has been estimated at 0.509.³ On the basis of these estimates along with observed growth in capital and employment, the relative contributions of these physical inputs to GDP growth could be gauged. Then contribution of TFP to GDP growth could be derived as a residual.

The data show that employment grew over the whole period at an average annual growth rate of 2.63 percent. With few exceptions, annual employment growth during the period 1990/91–2004/05 is remarkably stable, with a relatively small standard deviation of 0.45 percent (see table A.4). As a result of the stability of average employment growth, a significant co-variability between output and output per worker, as indicated in figure 1, and between capital and capital-labor ratio growth rates have been observed. Hence, abstracting from output per worker fluctuations, the growth of physical capital would be sufficient to characterize the behavioral structure of real output changes. Furthermore, stability of employment growth accompanied by restrained human capital development and restricted labor skills—arising from an inefficient formal educational system—limit the role of labor participation in the growth process (Kheir-El-Din and Moursi forthcoming). These observations suggest an alternative way to explain the contributions of various sources of GDP growth by decomposing output per worker into two components: one related to TFP growth and the other related to the effect of changing capital intensity in the economy as shown by the developments in the capital-labor ratio (see Appendix 1). Table 1 reflects this decomposition.

³ This is smaller than the capital share estimated in Kheir-El-Din and Moursi (forthcoming) for the period 1960-1998, that was found to be 0.606.

Table 1. Sources of Output per Worker Growth (average annual increase in %)

	90/91–04/05	90/91– 95/96	95/96–99/00	99/00–04/05
Output per worker growth	1.509	0.546	2.349	1.993
<i>From TFP</i>	-0.153	-1.088	0.081	0.782
<i>From increasing k ratio</i>	1.661	1.633	2.267	1.210
Memorandum items in %				
Investment/GDP ratio	21.178	19.824	23.820	20.689
Average annual growth rate of capital per worker	3.325	3.265	4.558	2.410

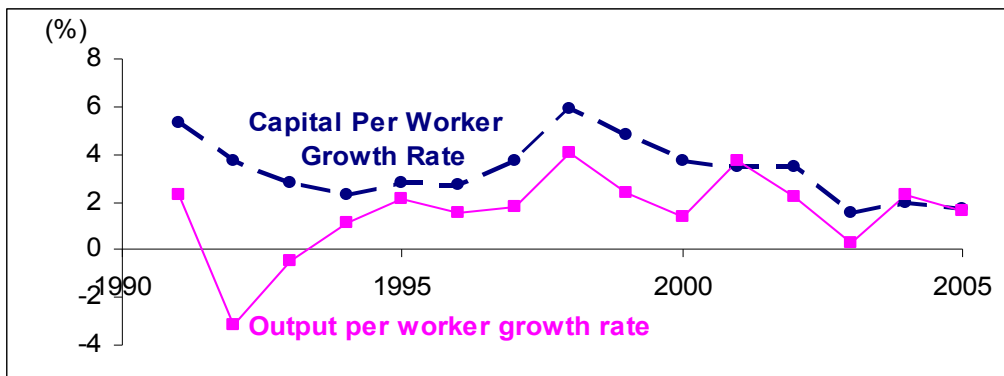
Source: Authors' estimates based on MOED and WDI database.

a. Changing capital intensity

Figure 2 reflects a considerable correlation between output per worker and capital per worker (capital intensity) growth. Not much is known about the structure, vintage and productivity of capital stock at either the aggregate or sectoral levels in Egypt. Investment flows have been recurrently used to account for the impact of capital changes on output growth (Kheir-El-Din and Moursi forthcoming).

The most noticeable feature of changes in capital intensity is its continuous decline since 1990/91 till the middle of the nineteen nineties, reflecting the sharp public investment reduction associated with the stabilization effort and unmatched by private investment restrained by low domestic savings. Capital intensity was further boosted by large public investments in mega projects starting 1995/96 and by private investments financed by easily accessible bank credit. By the end of the nineteen nineties, specifically by 1998/99, recessionary pressures undergone by the Egyptian economy and associated with the previously mentioned external shocks and lacking internal structural reforms, capital per worker declined again. Capital intensity was constrained by the reduction in public investments restricted by the widening budget deficit and increasing domestic debt. It was further reduced by contraction in private investment due to declining domestic savings and restrained bank credit, particularly towards the end of the period considered (Dobronogov and Iqbal 2005; and Abdel-Kader 2006). By 2003/04, capital intensity moderately increased, but this rise was not sustained during the following year, due to the recurrent government efforts to relieve unemployment by hiring a few thousand new graduates during the first few years of the 2000s.

Figure 2. Output per Worker and Capital per Worker Growth Rates (%)



Source: Capital stock was calculated from the Nehru and Dhareshwar dataset and the WDI Database; output per worker was calculated from GDP and employment figures from the MOED and WDI database.

These changes were, to a great extent, associated with growth in output per worker. In Egypt, there has always been a domestic resource gap. The discrepancy between domestic savings and investment has usually been bridged by external financial resources. It is thus plausible to infer that higher levels of investments, through raising domestic savings rate and bank credit and through encouraging foreign financial capital inflows would result in an increase in economic growth.

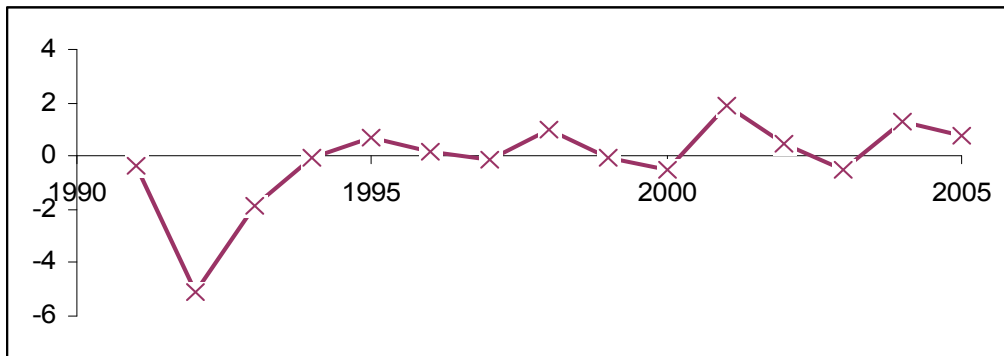
b. The role of technical progress

Figure 3 shows that TFP has been fluctuating during the period 1990/91– 2004/05, but has tended to rise moderately towards the end of the period, showing an increased contribution to output per worker annual growth estimated at 0.782 percent by the third sub-period, as indicated from table 1.

During the period 1990/91– 2004/05, output per worker increased at a modest annual rate of 1.51 percent. The contribution of TFP growth to output per worker was negative, while capital intensity increases tended to exceed growth in output per worker by around 10 percent.

Dividing the period of study into the three sub-periods, it appeared that these relative contributions to output per worker growth changed considerably. The relative contribution of TFP growth to output per worker growth increased from a negative value, ceding a predominant role to capital intensity to explain changes in output per worker, to an increasingly positive contribution of around 3.4 percent and further almost 40 percent, as derived from table 1.

Figure 3. Total Factor Productivity Growth Rate (%)



Source: Author's estimates based on MOED data and WDI database.

Thus, over the period considered, TFP growth has played an increasingly relative role in explaining the observed changes in output per worker growth, yet the effect of increasing capital intensity remained predominant. This predominance explains the observed decline of growth rate of output per worker due to a sharp fall in capital intensity associated with the reduction in public investments and the restricted private investments resulting from reduced access to bank credit.

3. AGGREGATE POVERTY TRENDS IN EGYPT

3.1. Poverty Measures During the Period 1990/91–2004/05

During the second half of the 1990s poverty in Egypt fell for the first time since the early 1980s. This fall was observed across various poverty measures—incidence, depth and severity of poverty all declined—based on a household-specific poverty line calculated as the sum of a food poverty line and a non-food poverty line, on the basis of the cost of basic needs (World Bank and Ministry of Planning 2002). This reduction in poverty measures was associated with the rebound of GDP growth in 1994/95, which was sustained till the end of the decade. Starting 2001/02 Egypt's economic performance slumped, in response to the September 11 attack and the resulting instability in the region. The slowdown in domestic credit reinforced these recessionary pressures. Furthermore, the devaluation following the pound floatation in January 2003 raised the rate of domestic average inflation from 2.4 percent in 2001/02 to 3.2 percent in 2002/03 and further to 8.1 percent in 2003/04,⁴ mainly as

⁴ The domestic average inflation rate is measured here on the basis of the consumer's price index (CPI) changes. If measured by the wholesale price index (WPI) it rises from 2.1 percent in 2001/02, to 11.6 percent in 2002/03 and further to 17.8 percent in 2003/04 (CBE various issues).

a result of the pass-through effect of devaluation. Given that poverty in Egypt is fairly shallow, many of those who escaped poverty during the 1990/91–1995/96 sub-period and further during the 1995/96–1999/2000 sub-period may have slipped back into it during the five following years (table 2). In 2004/05, overall poverty in Egypt stood at 19.56 percent using the absolute poverty line. It slightly exceeded the 1995/96 level after a decline in 1999/00 to 16.7 percent. Thus almost 19.56 percent of the population in Egypt, or approximately 13.6 million could not obtain their basic food and non-food needs. The depth of poverty is measured by the poverty gap index, which captures the percentage of shortfall below the poverty line for the whole population. The poverty gap index was 3.9 percent.

Table 2. Aggregate Poverty Measures (1990/91–2004/05) (%)

Indicator*	1990/91**	1995/96	1999/00	2004/05
P ₀	24.18	19.41	16.74	19.56
P ₁	6.54	3.39	2.97	3.90
P ₂	2.77	0.91	0.80	1.09

Source: Authors' estimates based on HIECS.

* P₀ is a measure of incidence of poverty; P₁ measures the depth of poverty and P₂ measures the severity of poverty (Foster, Green and Thorbecke 1984).

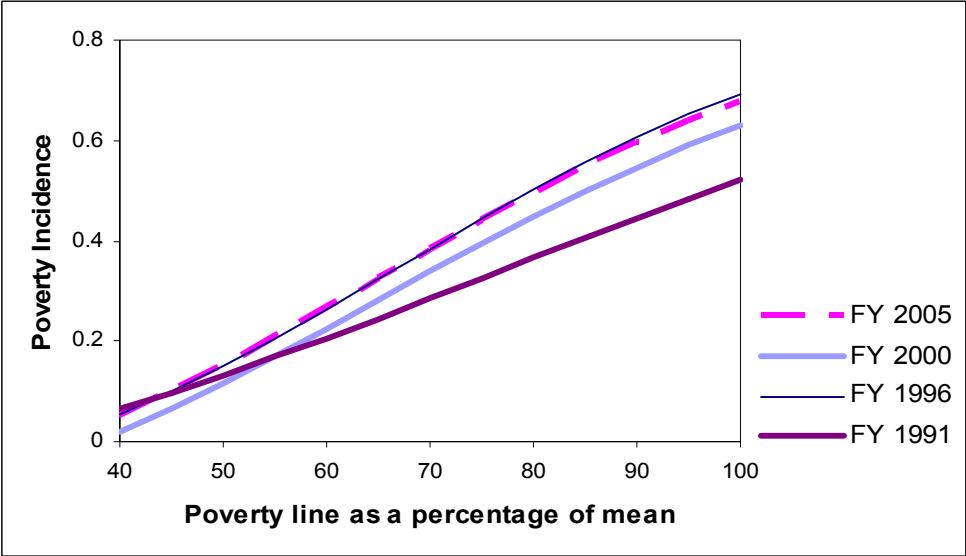
** Based on per capita poverty line, whereas in the subsequent three surveys poverty measures were calculated on the basis of a household-specific poverty line.

As indicated in the table, poverty measures are higher in 2004/05 compared to 1999/2000 and to 1995/96 regardless of poverty measures chosen, although the difference between 2004/05 and 1995/96 might not be significant. Poverty measures from the last three surveys indicate a significant decline in all poverty measures compared to the initial year 1990/91. Dominance analysis was carried out to assess the robustness of these results to the poverty lines applied. Curves for the three poverty measures were plotted using a wide range of values for the poverty line (40 percent to 100 percent of average per capita expenditure for the four survey years. Figure 4 illustrates the poverty incidence curves for the HIEC survey years.

The 1990/91 curve intersects with the three other curves for the lower levels of relative poverty lines defined at around 45 percent and 55 percent of the mean annual expenditure per capita. This indicates that the incidence of poverty declined from 1990/91 to 1995/96 and 2004/05 at the lowest poverty lines defined at around 45 percent of the mean per capita expenditure. Incidence of poverty declined further from 1990/91 to 1999/00 at the lowest end of expenditure distribution for those living at around 55 percent of the mean per capita

expenditures. However, poverty incidence in 1990/91 remained lower than in the three subsequent survey years for poverty lines exceeding 45 percent of the mean expenditure in 1995/96 and 2004/05 and 55 percent of the mean expenditure in 1999/00 suggesting that at poverty lines exceeding these levels, the welfare of poor expenditure groups under these higher poverty lines deteriorated compared to the initial year. Poverty incidence in 1995/96 almost coincided for all poverty lines below 80 percent of per capita expenditure with poverty incidence in 2004/05, but exceeded it for poverty lines above 80 percent of per capita expenditure. Finally, the poverty incidence curve, as well as those for depth and severity of poverty (not shown) in 2004/05 were always above the corresponding curves for 1999/00, indicating higher poverty, by all measures, in 2004/05 compared with 1999/00. Decomposition of poverty incidence into growth and redistribution components will explain these observations.

Figure 4. Poverty Incidence Curves (1990/91-2004/05)



Source: Authors' calculations based on HIECS.

3.2. Growth and Redistribution Components of Poverty Measures

Changes in the pattern of income distribution may be assessed by following up the changes in Gini coefficients over the whole period, as well as over successive sub-periods, as reflected in table 3.

Table 3. Gini Coefficients from Various HIECS

	1990/91	1995/96	1999/00	2004/05
Gini coefficients	0.446	0.345	0.362	0.320

Source: Authors' calculations based on HIECS.

Income distribution has generally improved from 1990/91 to 2004/05 as the Gini coefficient declined from 0.45 to 0.32. However the improvement was not uniform between successive household surveys. Income distribution improved significantly between the first two surveys from 0.45 to 0.35 as agricultural incomes rose sizably as a result of the implementation of the stabilization effort and liberalization of the economy. Liberalization of compulsory delivery prices of the main agricultural crops as well as price liberalization of the major agricultural inputs led to a net increase in agricultural incomes, explaining the observed improvement in income distribution. However, the third survey reflected a slight deterioration in income distribution to 0.36 associated with the worsening in expenditure distribution in Metropolitan governorates and particularly in Upper Egypt (World Bank and Ministry of Planning 2002). Accordingly, the estimated Gini coefficient increased, followed by a decline from 0.36 to 0.32 by 2004/05, reflecting an improvement in expenditure distribution between this last HIECS and the previous one of 1999/2000.

Inequality is usually captured by changes in summary indicators of income (expenditure) distribution, such as the Gini index. Yet such change is not necessarily an indicator of change in poverty incidence. This is because what matters is the change in the segment of the Lorenz distribution that lies to the left of the point which indicates the proportion of population in poverty. The index of income distribution may fail to accurately capture a change in this segment if there is a (compensatory) change in the segment of the Lorenz distribution that lies to the right, i.e. that corresponds to higher income brackets. It is quite possible that while distributional changes address equity concerns, there is no absolute gain to the poor. Similarly, pro-rich distributional shifts may come with absolute gains to the poor.

The observed changes in poverty measures can be decomposed into two effects. First there is the effect of a proportional change in all incomes that leaves the distribution of relative incomes unchanged, i.e. a *growth* effect. Second, there is the effect of a change in the distribution of relative incomes, which, by definition, is independent of the mean, i.e. a *distribution* effect. A change in poverty can then be shown to be a function of growth, distribution and the change in distribution (Datt and Ravallion 1992).

There were various distinctly different patterns overtime in terms of distribution and growth effects on changes in expenditures driving the differences in poverty outcomes over the whole period as well as over successive sub-periods (table 4). At the national level and over the whole period covered, the improved distribution effect led to a reduction in poverty incidence by 10.5 percent while the growth effect was associated with an increase in poverty incidence (P_0), by 5.9 percent, leading to an overall decline in poverty incidence by 4.6 percent. A similar pattern was observed during the first sub-period. However, during the second sub-period, the deterioration in income distribution dampened the favorable growth effect on reducing the poverty incidence, and poverty decreased by 2.7 percent. Relatively improved growth rates of GDP and slight deterioration in distribution, particularly against upper Egypt (World Bank and Ministry of Planning 2002) explain these developments between 1995/96 and 1999/00. Finally, over the last sub-period, 1999/00–2004/05, the improved distribution effect led to a reduction in poverty incidence (P_0) by 1.8 percent. However, the adverse impact of the slowdown in growth on increasing poverty incidence (4.6 percent) was larger than the effect of improved expenditure distribution (-1.8 percent), leading to an overall increase in poverty incidence by 2.8 percent.

Table 4. Growth and Redistribution Effects on Changes in Poverty Incidence P_0 , 1990/91-2004/05 (%)

	Change in Incidence of Poverty Due to		
	Growth	Redistribution	Actual Change
1990/91–2004/05	5.866	-10.486	-4.620
1990/91–1995/96	4.890	-9.660	-4.770
1995/96–1999/00	-3.631	0.954	-2.677
1999/00–2004/05	4.607	-1.780	2.827

Source: Authors' calculations based on HIECS.

Elasticities of poverty measures to changes in mean consumption expenditures and to the inequality index shown in Appendix 3 further support these observations.

3.3. Growth Incidence Curves

Although the economy's growth rate is usually measured by the rate of growth of per capita real GDP or GNP, changes in income for poverty indicators have to be measured by the change in *personal* or in *disposable* income or expenditure, in terms of which the poverty threshold is defined. Aside from members of households, there are other claimants to GDP or GNP, such as businesses and the government. Shares of different claimants do not necessarily remain unchanged. Thus it is possible, indeed quite normal, for the rate of growth of personal/disposable income (expenditure) to differ from the rate of growth of GDP/GNP. This divergence is an outcome of macroeconomic policies. This point will be taken up further in section 3.4.

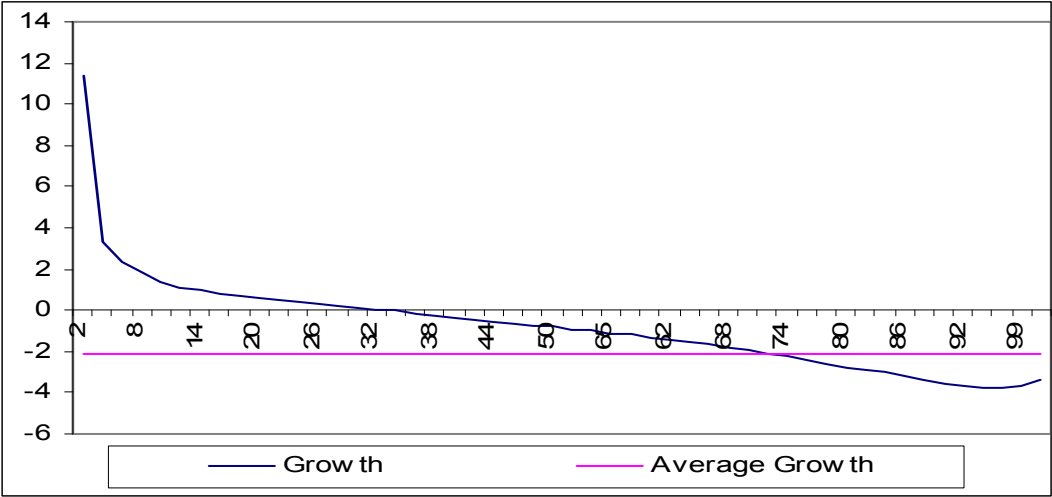
Moreover, as mentioned earlier, an improvement in income distribution, as reflected by a decline in the Gini coefficient is not necessarily associated with a decline in poverty incidence.

A more direct approach to assessing the impact of growth on poverty incidence is to consider growth rates of per capita income or expenditure of the poor. It is common to compare growth of mean incomes across the distribution ranked by income levels, sometimes called "Pen's parade" (following Pen 1971). To assess whether growth is equitable one may calculate, using Pen's parade, the growth rate in the mean income of the poorest percentiles. Table A.7 in Appendix 4 illustrates the growth of per capita expenditures by deciles over the survey years. Following Ravallion and Chen (2001), the "growth incidence curve" (GIC) shows how the growth rate for a given quantile varies across quantiles ranked by income/expenditure levels.

Figure 5 presents the Egyptian growth incidence curve (GIC) for the period 1990/91–2004/05, as well as for the three sub-periods considered. It is worth noting that the mean real per capita expenditure has been declining over the whole period of study, as well as during the first and third sub-periods. It has increased only during the second sub-period 1995/96–1999/00. GIC for the whole period is decreasing over all quantiles, implying that inequality declined, as higher quantiles are declining more rapidly than lower quantiles. The annualized percentage increase in per capita expenditure is estimated to have exceeded 10 percent for the poorest two percentiles, declined steadily, to reach zero around the 30th percentile and turned negative to reach -2 percent (the average growth of per capita expenditure) around the middle

of the eighth decile and continued to decline thereafter. This indicates that over the whole period under consideration, expenditure distribution has markedly improved, with a clear decline in poverty incidence. These developments are also depicted in table A.7 of Appendix 4.

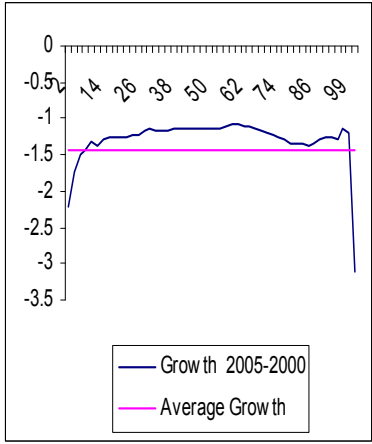
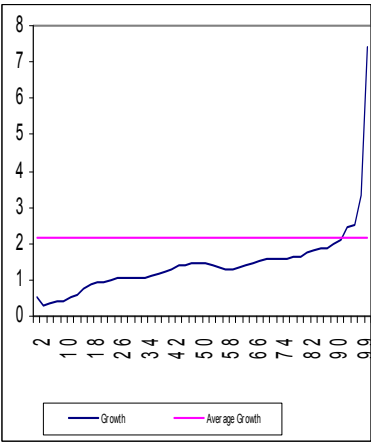
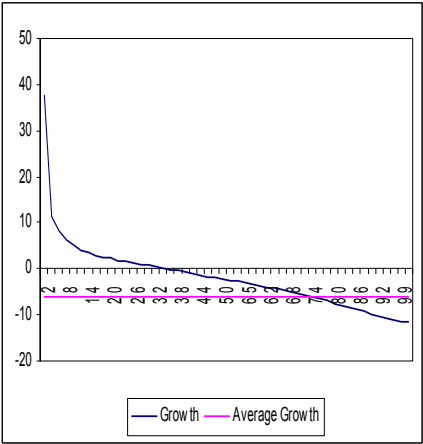
**Figure 5. Growth Incidence Curves for Egypt
(1990/91-2004/05)**



1990/91-1995/96

1995/96-1999/00

1999/00-2004/05



Source: Authors' calculations based on the four successive HIECS from 1990/91 to 2004/05.

However, this pattern has not been uniform over the three sub-periods. The observed improvement in expenditure distribution has occurred during the first sub-period (1990/91–1995/96) when the substantial stabilization effort was implemented and price liberalization occurred, particularly in agriculture. This was accompanied by a significant decline in all poverty measures (table 2), and a sharp fall in poverty incidence, as reflected by the decline in GIC over all quantiles, in the corresponding figure. The second sub-period (1995/96–

1999/00) witnessed a reversal of the pattern of expenditure distribution, with a slight increase in poverty measures. The annualized percentage increase in per capita expenditure was estimated to have been below 1 percent for the poorest percentiles, rose steadily to exceed the average growth rates of 2 percent by the 90th percentile and increased drastically for the richest decile. Poverty slightly increased but remained far below its level in 1990/91 and expenditure distribution deteriorated by the end of the second sub-period, as per capita expenditure of the poor increased at a much lower rate than the higher expenditure brackets.

The third sub-period reflected a different growth and distribution pattern. Average per capita expenditure declined by around 1.4 percent. However, the decline for the poorest percentiles exceeded 2 percent, remained negative but exceeded the average of 1.4 percent from the middle of the second to around the middle of the ninth decile and then dropped sharply for the highest percentiles in the tenth decile, indicating a sharp decline in per capita expenditures for the richest. Thus, by the end of the last sub-period, average per capita expenditure deteriorated in general, but the most hit by this deterioration were the poorest and the richest in the distribution ladder. The intermediate expenditure brackets were relatively less hit by these developments. Table 2a in Appendix 3 also confirms these developments. The same results could be obtained by integration on the growth incidence curve (Ravallion and Chen 2001), to estimate the pro-poor index.

3.4. Growth of GDP Per Capita versus Growth of Per Capita Expenditure

As mentioned earlier, the rate of growth of GDP is normally different from that of personal expenditure. This reflects further on the rate of growth of GDP (output) per capita versus that of per capita expenditure. Table 5 illustrates the differences between these annual growth rates over the periods considered. Per capita personal expenditure has declined annually by around 2.08 percent over the whole period. Yet this decline was not uniform, as the first and third sub-periods witnessed average annual declines of 5.98 percent and 1.43 percent respectively, while during the second sub-period (1995/96–1999/00), per capita expenditure has increased by an annual average rate of 2.18 percent. Per capita real GDP, however, grew over the whole period at an average annual rate of 2.24 percent, showing variations during various sub-periods. The second sub-period reflected a relatively better growth performance exceeding 3 percent annually.

Table 5. Average Annual Growth Rates of Real per Capita Expenditures and GDP (1990/91–2004/05) (%)

Real annual growth rate of	1990/91-2004/05	1990/91-1995/96	1995/96-1999/00	1999/00-2004/05
Per capita expenditures	-2.08	-5.98	2.18	-1.43
Per capita GDP	2.24	1.40	3.07	2.57

Source: Authors' calculations based on HIECS figures, MOED and WDI database.

These divergences between per capita expenditure and GDP growth rates result from macroeconomic policies, which affect the relative share of households compared to other claimants to GDP, principally businesses and the government. Such policies include taxes, transfers among claimants to GDP, policies related to wages as well as business practices concerning withheld profits. Further investigation of the reasons behind these divergences is required.

4. SECTORAL PATTERN OF GROWTH, DISTRIBUTION AND POVERTY

4.1. Egypt's Pattern of GDP Growth

Egypt's pattern of growth since the early 1990s can be characterized as follows:

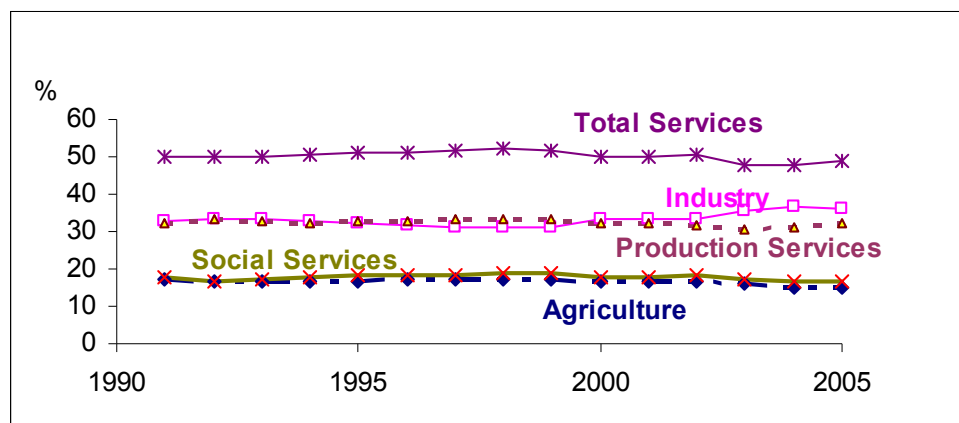
- The Egyptian economy continued to be a services-based economy. Despite fluctuations in their share of GDP, production and social services⁵ together exceeded on average 50 percent of GDP during the period considered, while industry and agriculture constituted on average around 33 percent and 16 percent of GDP (table A.1 in Appendix 4).
- The sectoral growth rate of value added generated in agriculture was persistently lower than that of industry and services. On average, agricultural value added grew at a modest annual rate of 2.47 percent compared to industry which grew at 5.9 percent. Industry includes manufacturing and mining, petroleum and petroleum products, electricity and construction. The standard deviations of value added for the two sectors were successively 4.15 percent and 5.10 percent. Production and social services, on

⁵ Production services include transportation and communications, Suez Canal, trade, finance, insurance and restaurants and hotels. Social services include real estate, public utilities, social insurance and social, governmental and personal services. The latter activities dominated the social services sub-sector, generating between 85.6 percent and 88 percent of value added in this sub-sector.

the other hand, exhibited diverging growth patterns. Production services grew on average at an annual rate of 4.13 percent ranging between -0.45 percent and 8.23 percent with a standard deviation of 2.59 percent, while social services grew at a lower average annual rate of 3.31 percent, within a wider range of -5.53 percent and 8.23 percent and a standard deviation of 4.61 percent (table A.2 in Appendix 4).

- Despite diverging growth rates, the sectoral composition of GDP remained remarkably stable, although the share of industry in GDP grew modestly to 36.07 percent by 2004/05 while that of agriculture deteriorated slightly to reach 14.9 percent. Similarly, the share of the two services subsectors grew modestly to 32.2 percent for production services whereas it fell to 16.8 percent for social services, as depicted in figure 6 and in table A.1 of Appendix 4.

Figure 6. Sectoral Shares in Real GDP (1990/91–2004/05)* (%)



Source: Authors' calculations based on MOED and WDI database.

*GDP is deflated using the WDI database deflator. Base Year = 1991/92.

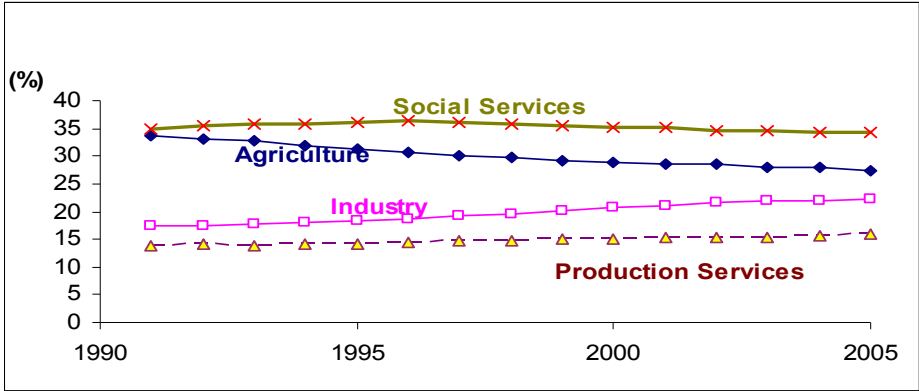
Changes in employment structure and in sectoral output per worker (as a proxy for labor productivity) can influence both determinants of change in poverty—namely the growth and distribution components. Growth in employment and in output per worker would improve the growth rate in the economy. Moreover, changes in employment structure and in sectoral output per worker would improve income distribution by pushing up the lower relevant segment of the Lorenz distribution. This can only be achieved by increasing employment and enhancing its remuneration particularly at the lower wage scale level in various sectors. This will be discussed sequentially in the following sections.

4.2. Shifts of Labor Between Sectors

Economic theory predicts that in a country with a large pool of surplus labor occupied in low productivity sectors (agriculture and social services as in the case of Egypt), rapid growth and industrialization result in relocation of agriculture and other low-productivity labor into the non-agriculture sector, where employment increases rapidly (Lewis 1954). In the process, overall output per worker increases because: (1) labor shifts from less productive sectors to more productive ones and (2) output per worker within each sector increases because of technology and institutional innovations.

The economy-wide capital-labor ratio should increase as labor moves from less capital-intensive sectors to more capital-intensive ones, and the sectors themselves also become more capital intensive. As labor moves out of agriculture, output per worker there increases and the gap between output per worker in agriculture and the other sectors declines over time. Therefore, as the economy grows the share of low productivity sectors in employment declines. This pattern was weakly observed in Egypt as indicated in figure 7. Employment shares show a slightly declining trend in agriculture and social services, and a modestly increasing trend in industry and production services.

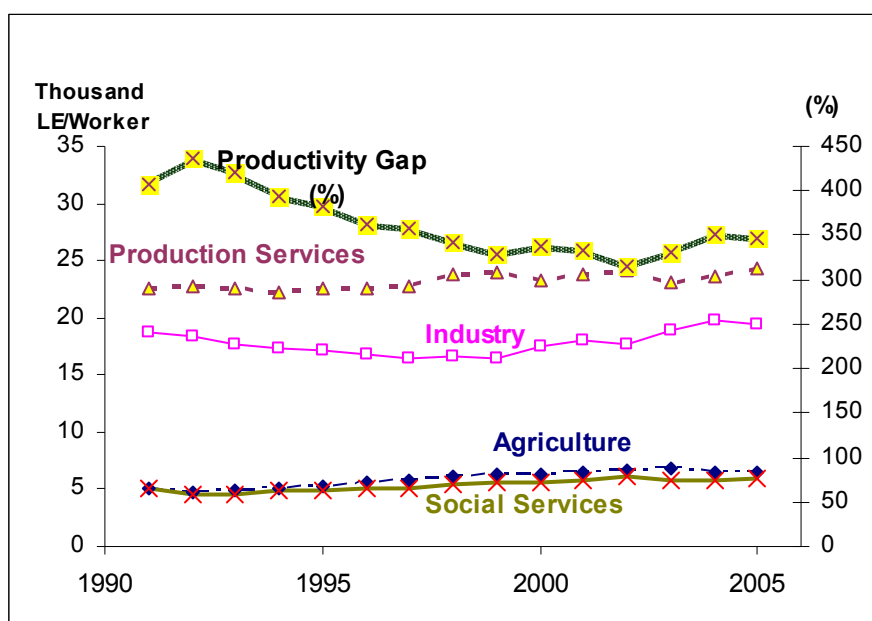
Figure 7. Employment Shares (1990/91–2004/05) (%)



Source: MOED.

In the meantime, output per worker in industry and production services remained high and modestly increased while that in agriculture and social services remained low with a slightly rising trend, as shown in figure 8. Consequently, the ratio of output per worker in industry and production services versus agriculture and social services, dubbed the output per worker gap, remained persistently high although tending to decline over the period of study, as indicated in tables A.5, A.6 in Appendix 4.

Figure 8. Sectoral Output per Worker and Output per Worker Gap*



Source: Authors' calculations based on MOED and WDI data.

* The gap is measured as the percentage of output per worker in "industry and production services" to output per worker in "agriculture and social services."

4.3. Explaining Sectoral Output per Worker Growth

To further support these findings, overall output per worker growth is decomposed into two sets of components related to labor shifts between sectors and output per worker growth within sectors (Kuijs and Wang 2005; and Appendix 2).

The decomposition results are shown in table 6. They indicate that output per worker growth has been modest over the whole period under consideration, not exceeding 1.535 annually. However, it tended to increase in 1995/96–1999/2000 to 2.38 percent annually from a low 0.566 percent during the first five years of stabilization effort, but declined somewhat to an annual average growth rate of 2.019 percent during the last five years, which were dominated by recessionary pressures. These pressures were only overcome by 2004/05.

With the exception of the first years of the stabilization effort (1990/91–1995/96), where shifts of labor between sectors dominated the low growth of overall output per worker, these labor shifts explained about 30 percent to 36 percent of the increase in overall growth of output per worker, while sectoral increases in output per worker explained the remaining over the last two sub-periods. In general, within sectors improvement in output per worker has

been higher in industry than in other sectors. Nevertheless these improvements have been modest and uneven showing a decline in some sectors of activity during the first sub-period. This indicates that *structural changes in the economy have been lagging, as the sectoral pattern of employment has not significantly evolved over the reform period considered, nor did output per worker within sectors remarkably increase.*

Table 6. Sectoral Contributions to Real Output per Worker Growth Rates (1990/91–2004/05) (average annual changes, %)

	90/91-04/05	90/91-95/96	95/96-99/00	99/00- 04/05
Overall output per worker growth rate	1.535	0.566	2.382	2.019
(1) From shifts in employment between sectors	0.611	0.473	0.850	0.586
(2) From sectoral output per worker increase	0.923	0.092	1.532	1.434
Agriculture	0.207	0.073	0.518	0.117
Industry	0.420	0.186	0.343	0.763
Production Services	0.171	0.005	0.251	0.307
Social Services	0.125	-0.173	0.420	0.246

Source: Authors' calculations based on MOED and WDI data.

Industry benefited from low prices of energy, electricity and utilities (including water) and from not being strictly subjected to environmental regulations enforcement. Cheap electricity for industry, due to subsidies on natural gas and oil products for power generation continues to encourage the establishment of energy-intensive and electricity-intensive industries, which did not significantly pay in terms of industrial growth promotion.

Development of the production services sector was not significantly stimulated. It continued to suffer from restrictions, which constrain its performance. A large share of employment continues to be trapped in low-productivity government sector, with insignificant efforts to upgrade the bureaucracy, which still employs around 72 percent of labor engaged in social services and 24.5 percent of total employment. Similarly, low output per worker agriculture continues to employ more than 27.5 percent of workers in 2004/05. These two low output per worker sectors employ together more than half the number of workers in Egypt. Hence the necessity of focusing the efforts to enhance output per worker in these two highly labor intensive activities: the government and agriculture, as a prerequisite for a serious growth promotion and poverty reduction strategy.

4.4. Poverty and Sector of Employment

Most of the poor rely for their subsistence on the only asset they have: labor. Whether they are able to use this asset to escape poverty largely depends on how successful they are in finding work and how much they are able to earn.

Khan (2005) detected five channels through which employment can reduce poverty: 1) an increase in wage employment; 2) an increase in real wage; 3) an increase in self-employment; 4) an increase in productivity in self-employment; and 5) an increase in the terms of exchange of output of self-employment.⁶ Poverty declines if the outcome of these channels is favorable to the poor.

At the national level and according to the 2004/05 HIECS, the poor were over-represented in agriculture, as reflected in table 7. About 43.9 percent of the working poor heads of households were engaged in agricultural activities, compared to 28.9 percent for the entire population, while household heads engaged in industry and both production and social services had a lower share among the poor (a higher share among the non-poor) than their share in the general population. The same pattern was observed over all survey years, reflecting the persistence of poverty in agriculture. This observation is consistent with low output per worker in agricultural activities.

Additionally, regional disaggregation shows that in both urban and rural areas the poor were highly over-represented in agricultural activities in all survey years except in urban areas in 1995/96. They were also over-represented in industrial activities in 1995/96 and in production services in 1990/91 in urban areas, reflecting the poor conditions of those engaged in construction as well as those at the lower wage scale in manufacturing and in production services. Surprisingly, those engaged in social services (which were shown to be mainly employed by the government) represent 21.1 percent of the poor and 25.5 percent in overall employment in 2004/05. Their shares among the poor are also lower than their shares in total employment in both rural and urban areas as well as over all survey years. This indicates that although output per worker in social services, and particularly in government employment, is the lowest among sectors of activity, as reflected in figure 8, the modest but secure and regular government salaries along with the opportunities for moonlighting secure expenditure

⁶ The analytical framework in this part of the paper is more fully discussed in Khan (2001).

levels, which reduce the incidence of poverty among those engaged in such employment (see Appendix 4 table A.8).

Table 7. Percentage Shares of the Poor and Non-Poor by Economic Activities of Heads of Households, all Egypt (1990/91–2004/05) %

	All Egypt					
	Non-Poor	Poor	All	Non-Poor	Poor	All
	1990/91			1995/96		
Agriculture	30.44	45.07	34.06	29.72	46.27	33.08
Industry	24.17	18.77	22.83	21.76	19.82	21.36
Production Services	21.14	17.73	20.29	22.36	14.06	20.68
Social Services	24.26	18.43	22.81	26.16	19.85	24.88
Total	100	100	100	100	100	100
	1999/00			2004/05		
Agriculture	27.77	45.83	30.93	25.15	43.88	28.93
Industry	21.88	16.49	20.94	22.66	18.38	21.80
Production Services	23.45	16.36	22.21	25.52	16.66	23.74
Social Services	26.90	21.33	25.92	26.66	21.08	25.54
Total	100	100	100	100	100	100

Source: Authors' calculations based on various HIECS.

The 1999/00–2004/05 period exhibited employment movements, from social services towards production services in urban areas. Employment for the poor shifted from services to industry in urban areas and from agriculture to industry in rural areas. As output per worker is lower in agriculture than in industry and in social services than in production services, these shifts may well have been the reason for improvements in income distribution observed between 1999/00 and 2004/05.

The analysis of HIECS data highlights that agriculture is the single most important source of rural employment for the poorest, the landless and for women. The poorest are mostly employed as agricultural wage workers. Across income groups, the percentage of wage workers declines steadily while that of farm self-employment rises. Furthermore, the rural non-poor are likely to be more engaged in non-agricultural activities than the poor. Across income groups, the share of total income from non-agricultural sources rises steadily with living standards while agricultural income goes in the opposite direction. Non-farm employment provides more security. HIECS data show that households living on farm income only (or on farm income and transfers) are the poorest and the most affected by income

fluctuations of agricultural income. The data also show that non-farm self-employment and informal employment in micro enterprises reflect high poverty incidence. These observations highlight the necessity of supporting agricultural development and boosting agricultural output per worker in addition to promoting non-farm self-employment and informal employment in micro enterprises among the poor to ensure inclusiveness of the poor in the growth process.

5. ECONOMIC POLICIES FOR EQUITABLE GROWTH

A last issue is whether there are specific policies and strategies that would simultaneously lead to high and sustained GDP growth, more equitable distribution and a rapid reduction in poverty, i.e. policies that would secure inclusiveness of the poor as well as pro-growth outcomes. Considering the experiences of countries that have succeeded in significantly reducing poverty along with achieving high and sustained growth, a number of policy choices have to be addressed. Most importantly are the following:

5.1. The Choice of Growth Sectors

Although economic growth is necessary to reduce poverty, the orientation of this process is also important. Which sectors should be given priority in an inclusive growth strategy have to be determined within a poverty reduction growth strategy.

The dual economy models of Lewis (1954) and Fei and Ranis (1965) provided an attempt to understand the role of inter-sectoral linkages, which have been considered essential when formulating a development strategy. Since the 1960s this strategy was focused on expanding industrial activities. Most developing countries increased trade barriers to protect the development of domestic manufacturing. Some countries, mostly in Asia, succeeded in developing a competitive industry. However, such strategy did not lead to an internationally competitive industry in Egypt and turned out to be devastating for agricultural traditional production which was heavily taxed to provide cheap inputs to manufacturing and low-cost food to the industrial and urban workforce. This did not only affect export revenues but also employment and poverty both in urban and rural areas. Since incomes in agriculture deteriorated, people moved to the city, looking for jobs, but the majority ended up in the informal sector or in open unemployment. Hence, poverty increased in both urban and rural areas.

It is now clear that supporting the agricultural sector is necessary to increase its productivity and reduce poverty in the countryside. Reforming the rural environment and increasing net earnings are necessary to increase growth in a sustainable manner in agriculture (Christiansen, Demery and Kühl 2006).

Results from India showed that agricultural growth is more important than manufacturing growth for poverty reduction (Ravallion and Datt 1996). Even if manufacturing growth matters more for overall growth, agriculture growth is necessary for both employment growth and poverty reduction.

Employment shifts from informal towards modern (formal) sector activities and improving investment and working conditions in micro and small enterprises, in both urban and rural areas, have also been shown to be an important factor in explaining changes in poverty.

5.2. The Role of Government

Changes in tax and public expenditures policies are important to achieve immediate poverty alleviation and to support processes that enhance growth and achieve poverty reduction in the longer term.

The efficiency and composition of public expenditures and taxes are critical determinants of growth and poverty reduction. Three types of impact from reallocation of public expenditures and changing the tax structure may be distinguished. 1) When relative prices and factor incomes change, income distribution and poverty will change. 2) The composition of government expenditures affects sectoral productivity and hence labor demand and household incomes. 3) Changes in the supply of public services, such as education and health care, impact the households' possibility to acquire human capital, (Bigsten and Levin 2001).

Increasing budget deficit pressures in Egypt induce the government to reduce capital expenditures rather than recurrent expenditures particularly the government wage bill and subsidies which have a clear urban bias towards government employment and middle income households. While protecting urban households from a short and medium term income loss, this has a longer term negative impact on the rural poor as government investments in agriculture and rural infrastructure decline, resulting in a long-term decline in agricultural production. Furthermore, this limits the government capacity to provide financing, technical

support and training to micro and small enterprises, thus depriving them from an important source of support.

This suggests that an appropriate growth strategy must focus on the special features of poverty in Egypt which is concentrated in micro and small enterprises and in the agricultural sector. Ensuring the availability of critical inputs for micro and small businesses is thus a priority area. Reducing regulatory obstacles to starting, operating and dissolving small businesses is essential. Increasing poverty-oriented investments in rural areas and supporting agricultural development are all necessary. Also necessary are supporting local governments to plan and implement priority local projects and ensuring the flexibility to involve NGOs, community organizations and private sector participation in such investments (World Bank and Ministry of Planning 2004).

A reallocation of government expenditures may also improve the supply of health and education services, however, this does not necessarily benefit the poor, as spending on such social services is not well targeted to the poorest households. Thus reallocation of government expenditures is not sufficient. Policies must be based on understanding the factors that govern household decisions concerning health care and schooling and on providing the means to ensure better outcomes of subsidized social services for the poor.

Provision of public services in Egypt as well as in many countries is constrained by low levels of public revenues which could, in principle, be solved by higher levels of taxation. However, increased taxation might constrain private investment and negatively impact future growth and tax revenue collection. Thus supporting the mobilization of voluntary participation of civil society and the private sector in providing such services on a non-profit basis is warranted. This could be encouraged through various incentive schemes.

Equitable growth strategy should finally entail measures targeted directly to the poor. Universal subsidies, currently prevailing in Egypt and designed to benefit the whole population, have proven inefficient, distortionary, and fiscally unsustainable, thus constraining long-term growth. Targeting such subsidies is essential, one approach is *self-targeting* which is designed in such a way that only members of the target group find it worthwhile to participate. Another approach is *characteristics or indicator targeting* which relies on making the service or transfer contingent on easily observable characteristics such as sex, age, size of land holding, and/or region of residence.

In sum, the government has to consider two important issues: 1) improved public service delivery is crucial in promoting growth and reducing poverty; 2) tax policies need to be further redesigned in order to satisfy an increasing demand for public services, while providing an enabling environment for private sector and civil society participation and development.

5.3. Inclusive Growth and Human Capital

Human capital accumulation has been an important factor in accounting for differences in growth rates and distribution across countries. An extensive literature has developed on the effects of education expansion on growth. Yet, relatively little is known on its effects on income distribution. The increase in supply of educated workers must be matched by an increase in labor demand, which in turn will depend on economic growth. Egypt's experience has shown a modest contribution of human capital accumulation to growth, as indicated earlier.

Four priority areas of education reform which are especially beneficial for the poor and are likely to increase their potential for future earnings include: 1) combating illiteracy; 2) enhancing access and reducing costs of education for the poor; 3) improving the quality and relevance of basic and secondary general and technical education; and 4) enhancing access of the poor to higher education (World Bank and Ministry of Planning 2004).

5.4. Policy Measures to Reduce Risk and Income Volatility

The World Development Report (World Bank 2000) extends the concept of poverty beyond income and consumption expenditure, education and health to include risk and vulnerability, as well as voicelessness and powerlessness. Thus emphasis on empowerment and security becomes a crucial component in a poverty reduction strategy. The concept of social capital has been used to describe the ability of individuals to secure benefits as a result of membership in social networks and other social structures. This is particularly important in the areas of micro finance and access to savings facilities.

Rapid and sustainable poverty reduction depends upon the interaction of a wide range of policy measures. The potential for financial development as an instrument of economic management and of poverty reduction will be unfulfilled so long as conventional financial institutions are reluctant to expand their activities beyond their traditional borrowers. Microfinance institutions can play an important role in filling this gap and possibly also help

to reduce imperfections in the credit market, improving access to credit for poor households in both urban and rural areas. However, many programs that have been successful in reaching the poor are not financially sustainable and/or based on individual initiatives which need to be supported, developed and institutionalized.

6. CONCLUDING REMARKS

The analysis of determinants of economic growth, as measured by growth of output per worker shows that it depends on capital intensity and TFP growth. The accumulation of capital, as reflected by physical investment to GDP ratio, increasing capital to output ratio and average annual growth rate of capital per worker have appeared to be highly correlated with growth. Human capital accumulation due to education showed no significant contribution to growth. Over the whole period of study (1990/91–2004/05), capital intensity growth explained more than the observed growth in output per worker (110.07 percent), reflecting inefficient utilization of investment and a decline in TFP over the whole period. This, in turn, indicates that the efficiency in resource allocation, and the acquisition and application of modern technology have been lagging, and output per worker growth depended primarily on increasing capital intensity. However, following up the relative contributions of capital intensity and TFP growth, it appears that over the three sub-periods considered, the role of TFP growth increased while that of capital intensity declined to reach respectively around 39 percent and 61 percent of output per worker growth during the last sub-period considered.

The evidence reviewed in this study shows that the proportion living in poverty over the whole period declined. However, the sharpest decline occurred during the first sub-period, when the stabilization and liberalization program started to be implemented. Poverty declined further during the second sub-period in response to the higher growth rate of GDP and of output per worker achieved. However, the incidence of poverty tended to rise again towards its incidence level of the first sub-period as a result of the recessionary pressures on the Egyptian economy due to both external and internal factors, mainly lax structural reforms and delayed responses to external shocks. The structural reforms implemented over the last year considered 2004/05, and the resulting improvement in growth performance did not yet translate into a significant decline in poverty incidence. Over the whole period, poverty remained shallow reflecting that any increase or decline in output growth may be accompanied by a decline or increase in poverty for those who are close to the poverty line.

The sectoral pattern of growth over the period considered has remained remarkably stable, with marginal shifts of employment from low output per worker sectors (agriculture and social services) to relatively higher output per worker sectors (industry and production services). Furthermore, sectoral output per worker increases remained modest, in all sectors, and the gap between relatively high output per worker sectors and low output per worker sectors remained high, although declining. Over the whole period considered, shifts between sectors accounted for around 40 percent of annual output per worker growth, while sectoral output per worker increases accounted for the rest of the modest annual increase of output per worker of 1.5 percent.

In accordance with the low level of output per worker in agriculture, poverty appears to be mostly concentrated in this sector, pointing to the necessity of focusing on supporting growth in agriculture in an attempt to reduce poverty.

The development policy of the government emphasizes the necessity of promoting investment and hence growth as a prerequisite for poverty reduction. The evidence presented highlights that growth alone has not been sufficient to achieve this end. Although GDP growth has been achieved, it was not reflected in improved income distribution, lower poverty and increased per capita personal expenditure. Hence the need for ensuring that growth reaches households and particularly the poor among them. As mentioned, GDP is shared by other agents than households, such as businesses and the government. The share of each agent is determined, among other factors, by macroeconomic policies, including wage policy, taxation, transfers and business profit withholding policy.

Empirical evidence shows that countries that have been successful in achieving and sustaining economic growth have also been successful in reducing poverty. However, when growth is associated with improved income distribution, the reduction in poverty is faster, particularly if policies aimed at achieving equity do not negatively impact growth. Policies that enhance equity and ensure inclusiveness should be beneficial to growth. Such policies should aim at building assets for the poor and support demand for these assets; improving provision and targeting of social services; expansion of education; supporting agricultural development and increasing the relative prices of agricultural commodities and the wages of unskilled workers in both urban and rural; providing transfers to reduce risk for the poor; and creating an environment conducive to growth. These policies, however, require

microeconomic measures aimed at increasing market access to the poor and improving the functioning of such markets; and macroeconomic policies aimed at ensuring stability and improving benefit distribution through progressive taxation and better targeted expenditure allocation. Improving institutions, empowering the poor and providing good governance are also necessary.

Appendix 1

Aggregate Production Function and Decomposition of Output per Worker

The aggregate production function (APF) may be written as:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \quad (1)$$

where Y_t is a linearly homogeneous Coble-Douglas production function with Hicks-neutral technical progress, and two factor inputs: K_t capital stock at constant 1991/92 prices and labor L_t expressed in physical units, the coefficient α , $0 < \alpha < 1$ is the share of capital in income and A_t denotes TFP. The exponents of capital and labor in the APF are set to add up to unity, following the assumption of constant returns to scale.

Dividing by L , taking natural logs and differentiating (1) totally with respect to time, the production function may be expressed in per-worker form as:

$$\dot{y}_t = \alpha \dot{k}_t + \dot{a}_t \quad (2)$$

where the lower case letters, \dot{y} and \dot{k} measure the logarithmic growth rates of output per worker (\dot{y}) and of capital per worker (\dot{k}); $y = \ln \frac{Y}{L}$, $k = \ln \frac{K}{L}$. The variable \dot{a} is an unobserved index of technical progress reflecting the growth in TFP or $\frac{dA}{A}$, $a = \ln A$.

Output per worker growth \dot{y} is thus the sum of two components: the contribution of capital intensity $\alpha \dot{k}$ and the contribution of TFP growth \dot{a} .

Appendix 2

Decomposition of Overall Output per Worker Growth Rates

Shifts in Employment between Sectors versus Growth in Sectoral Output per Worker

Overall output per worker ($y = Y/L$) may be defined as: $\frac{Y_1 + Y_2 + Y_3 + Y_4}{L_1 + L_2 + L_3 + L_4}$ where Y_i and L_i ($i = 1, \dots, 4$) are sectoral output (value added at constant 1991/92 prices) and sectoral employment respectively. This definition may be written as:

$$Y = l_1 y_1 + l_2 y_2 + l_3 y_3 + l_4 y_4 \quad (3)$$

where, as before, y is overall output per worker, y_i is output per worker in sector i and l_i is the share of sector i in total employment.

By partially differentiating equation (3) with respect to time and dividing through by y , the growth rate of overall output per worker may be written as:

$$\begin{aligned} g(y) &= g(l_1) \times l_1 \times y_1 + l_1 \times g(y_1) \times y_1 \\ &+ g(l_2) \times l_2 \times y_2 + l_2 \times g(y_2) \times y_2 \\ &+ g(l_3) \times l_3 \times y_3 + l_3 \times g(y_3) \times y_3 \\ &+ g(l_4) \times l_4 \times y_4 + l_4 \times g(y_4) \times y_4 \end{aligned}$$

where $g(x)$ denotes the growth rate of x ($g(x) = \frac{\partial x / \partial t}{x}$). The first column of elements captures the effect of shifts of labor between sectors, while the second column represents the growth in output per worker within each of the four sectors.

Appendix 3

Further Indices of Poverty Incidence

1. Elasticity of Poverty Measures to Mean Consumption and Inequality

How much a given growth rate can reduce poverty levels has changed over time. Elasticity of poverty incidence to changes in the mean consumption expenditure may explain the impact of growth on poverty trends. Table 1a shows estimates of the elasticity of poverty measures to growth—i.e. the percentage change in poverty indices, given a percentage change in mean expenditure levels. It appears that poverty in 1999/00 was more responsive to growth in mean expenditure compared to other survey years, while it was least responsive in 1990/91. This indicates that a given percentage increase in the mean consumption expenditure in 1999/00 would reduce all poverty measures more than in other survey years, whereas it would reduce them least in 1990/91.

On the other hand, the elasticity of poverty measures to the inequality index (Gini coefficient) was highest in 1999/2000, closely matched by the corresponding elasticities in 1990/91. The elasticities with respect to the Gini index were lower in 1995/96 and in 2004/05. This implies that a given percentage change in Gini indices in the four surveys would change poverty measures in 1990/91 and 1999/00 relatively more than in 1995/96 and 2004/05, indicating a higher sensitivity of poverty measures to distribution changes in the former two surveys than in the latter two.

Table 1a: Elasticity of Poverty Measures to Mean Consumption and Inequality

		Consumption Elasticity	Gini Index Elasticity
1990/91	P0	-1.85	3.15
	P1	-2.79	7.47
	P2	-3.71	11.75
1995/96	P0	-3.49	2.77
	P1	-5.57	6.22
	P2	-7.68	9.68
1999/00	P0	-3.57	3.43
	P1	-5.74	7.47
	P2	-7.94	11.54
2004/05	P0	-3.05	2.83
	P1	-4.10	5.72
	P2	-4.72	8.22

Source: Authors' calculations based on MOED and WDI data.

2. Pro-Poor Index

The pro-poor growth rate (PPG) can be measured by the mean growth rate of expenditure for the poor,⁷ defined as those living below the poverty line at the initial date.

Table 2a gives PPG measure of the rate of equitable growth for different quintiles. Looking at the whole period (1990/91–2004/05), change in per capita expenditure was slightly pro-poor, growth rate for the poorest quintile was positive (0.6 percent) while it was negative for the other quintiles. For the second quintile, although per capita expenditure declined, it declined less than the higher three quintiles. Growth was highly equitable between 1990/91 and 1995/96, as indicated by the high growth rate in per capita expenditure for the poorest quintile, which rose to 5.74 percent, followed by the 2nd and 3rd quintiles, while the growth rate for the two richest quintiles was negative, indicating a relative decline in their per capita expenditures. During the second sub-period (1995/96–1999/00) growth fell considerably to 0.58 percent for the poorest quintile, furthermore it was not equitable, as per capita expenditure for the poorest quintile grew at a lower rate than per capita expenditure for the following four quintiles confirming the observed deterioration in expenditure (income) distribution. Finally, the last sub-period, from 1999/00 to 2004/05, witnessed a decline in per capita expenditures in all quintiles. The highest decline being in the poorest and the richest quintiles, which indicates that the growth experience was not pro-poor, but it was rather in favor of the middle three quintiles which suffered a relatively lower decline than the first and fifth quintiles.

Table 2a. Growth Rate of Per Capita Expenditure for Different Quintiles (PPG) (%)

	20	40	60	80	100
1990/91–2004/05	0.60	-0.35	-1.34	-2.75	-2.08
1990/91–1995/96	5.74	2.49	0.25	-2.12	-5.98
1995/96–1999/00	0.58	0.87	1.08	1.25	2.18
1999/00–2004/05	-1.42	-1.28	-1.21	-1.22	-1.43

Source: Authors' calculations based on MOED and WDI data.

⁷ Note that this is not the same as the growth rate in the mean income (or expenditure) of the poor.

Appendix 4

Some Additional Tables

Table A.1. Sectoral Distribution of GDP (Constant Prices) (%)

	Agriculture	Industry	Production Services	Social Services	Total
1991	17.37	32.86	32.03	17.74	100.00
1992	16.54	33.34	33.27	16.85	100.00
1993	16.71	33.07	32.89	17.33	100.00
1994	16.87	32.76	32.34	18.03	100.00
1995	16.78	32.30	35.59	18.33	100.00
1996	17.26	31.62	32.61	18.51	100.00
1997	16.95	31.22	33.55	18.28	100.00
1998	17.11	30.86	33.39	18.63	100.00
1999	17.32	30.92	33.11	18.65	100.00
2000	16.74	33.13	32.25	17.88	100.00
2001	16.56	33.33	32.13	17.98	100.00
2002	16.46	33.20	31.85	18.49	100.00
2003	16.34	35.67	30.75	17.24	100.00
2004	15.18	36.87	31.21	16.74	100.00
2005	14.92	36.07	32.21	16.81	100.00

Source: Authors' calculations based on MOED and WDI data.

Table A.2. Growth Rate of GDP, by Sector of Activity (%)

	Agriculture	Industry	Production Services	Social Services	Total
1991	-5.875	20.274	3.147	-3.713	4.984
1992	-5.249	0.946	3.367	-5.527	-0.503
1993	2.533	0.681	0.312	4.390	1.489
1994	5.162	3.150	2.434	8.352	4.152
1995	4.642	3.781	6.037	7.003	5.237
1996	7.678	2.455	4.750	5.728	4.679
1997	3.142	3.670	8.035	3.659	5.000
1998	7.146	4.947	5.630	8.229	6.149
1999	6.261	5.195	4.142	5.117	5.012
2000	0.550	11.470	1.291	-0.297	4.013
2001	4.633	6.412	5.410	6.366	5.783
2002	3.618	3.821	3.290	7.206	4.225
2003	2.309	10.743	-0.446	-3.904	3.083
2004	-2.671	8.331	6.348	1.756	4.790
2005	3.119	2.587	8.226	5.293	4.881
Mean	2.47	5.90	4.13	3.31	4.20
Standard Deviation	4.15	5.10	2.59	4.61	1.71

Source: Authors' calculations based on MOED and WDI data.

Table A.3. Sectoral Employment Shares (%)

	Agriculture	Industry	Production Services	Social Services	Total
1991	33.74	17.31	13.96	34.99	100
1992	33.12	17.38	13.99	35.50	100
1993	32.67	17.73	13.85	35.75	100
1994	32.01	18.14	14.01	35.84	100
1995	31.30	18.46	14.18	36.06	100
1996	30.59	18.79	14.34	36.28	100
1997	30.00	19.13	14.88	35.99	100
1998	29.74	19.59	14.82	35.86	100
1999	29.31	20.21	14.93	35.55	100
2000	28.91	20.75	15.13	35.21	100
2001	28.67	20.97	15.27	35.08	100
2002	28.44	21.79	15.29	34.48	100
2003	28.08	22.00	15.45	34.47	100
2004	27.86	22.10	15.64	34.40	100
2005	27.52	22.39	15.93	34.16	100

Source: MOED.

Table A.4. Growth Rates of Sectoral and Overall Employment (%)

	Agriculture	Industry	Production Services	Social Services	Total
1991	0.94	3.21	3.21	3.82	2.64
1992	0.86	3.15	2.95	4.25	2.74
1993	0.57	3.98	0.94	2.66	1.96
1994	0.94	5.39	4.28	3.29	3.03
1995	0.78	4.89	4.30	3.71	3.07
1996	0.77	4.99	4.22	3.71	3.10
1997	1.15	4.99	7.09	2.35	3.16
1998	1.16	4.49	1.61	1.67	2.05
1999	1.15	5.85	3.34	1.73	2.60
2000	1.19	5.38	4.00	1.60	2.60
2001	1.16	3.09	2.95	1.64	2.00
2002	1.14	5.96	2.13	0.24	1.98
2003	1.50	3.80	3.89	2.76	2.80
2004	1.68	2.93	3.71	2.26	2.47
2005	1.91	4.52	5.10	2.47	3.18
Mean	1.13	4.44	3.58	2.54	2.63
Standard Deviation	0.35	1.03	1.47	1.08	0.45

Source: Authors' calculations based on MOED.

Table A.5. Output Per Worker (Constant Prices) (in thousand LE/worker)

	Agriculture	Industry	Production Services	Social Services	Total
1991	5.07	18.69	22.60	4.99	9.8475
1992	4.76	18.29	22.69	4.53	9.5370
1993	4.86	17.71	22.55	4.60	9.4932
1994	5.06	17.33	22.15	4.83	9.5962
1995	5.25	17.15	22.52	4.98	9.7981
1996	5.61	16.74	22.63	5.08	9.9483
1997	5.72	16.52	22.83	5.14	10.1256
1998	6.06	16.60	23.73	5.47	10.5326
1999	6.37	16.49	23.92	5.66	10.7801
2000	6.33	17.45	23.29	5.55	10.9285
2001	6.55	18.01	23.85	5.81	11.3338
2002	6.71	17.65	24.12	6.21	11.5829
2003	6.76	18.83	23.11	5.81	11.6149
2004	6.47	19.82	23.70	5.78	11.8778
2005	6.55	19.45	24.41	5.94	12.0739
Mean	5.87	17.78	23.21	5.36	10.60
Standard Deviation	0.72	1.06	0.70	0.52	0.91

Source: Authors' calculations based on MOED and WDI data.

Table A.6. Growth Rates of Output per Worker (%)

	Agriculture	Industry	Production Services	Social Services	Total
1991	-6.751	16.535	-0.058	-7.252	2.284
1992	-6.061	-2.139	0.409	-9.380	-3.153
1993	1.950	-3.170	-0.619	1.681	-0.459
1994	4.184	-2.130	-1.769	4.897	1.086
1995	3.833	-1.057	1.665	3.174	2.103
1996	6.852	-2.413	0.511	1.947	1.533
1997	1.969	-1.262	0.879	1.275	1.782
1998	5.919	0.435	3.953	6.454	4.019
1999	5.058	-0.617	0.773	3.333	2.350
2000	-0.636	5.783	-2.608	-1.863	1.376
2001	3.433	3.223	2.385	4.653	3.709
2002	2.452	-2.014	1.136	6.953	2.198
2003	0.798	6.692	-4.170	-6.483	0.276
2004	-4.283	5.249	2.544	-0.495	2.264
2005	1.189	-1.849	2.970	2.756	1.650
Mean	1.33	1.42	0.53	0.78	1.53
Standard Deviation	4.16	5.31	2.17	5.00	1.72

Source: Authors' calculations based on MOED and WDI data.

Table A.7. Percentage Change in Per Capita Expenditure by Deciles, 1990/91-2004/05

Population Deciles	90/91-04/05	90/91-95/96	95/96-99/00	99/00-04/05
10	2.96	9.92	0.38	-1.60
20	0.82	3.05	0.74	-1.29
30	0.29	1.20	1.03	-1.20
40	-0.15	-0.17	1.12	-1.15
50	-0.63	-1.73	1.40	-1.13
60	-1.11	-3.05	1.36	-1.11
70	-1.68	-4.64	1.45	-1.14
80	-2.43	-6.64	1.62	-1.29
90	-3.23	-8.90	1.84	-1.32
100	-3.63	-11.17	4.40	-1.93
Average Growth	-2.08	-5.98	2.18	-1.43

Source: Authors' calculations based on HIECS, CAPMAS.

Table A.8. Percentage Shares of the Poor and Non-Poor by Economic Activities of Heads Households (1990/91–2004/05)

	Urban			Rural			All Egypt		
	Percentage Share			Percentage Share			Percentage Share		
	Non Poor	Poor	All	Non Poor	Poor	All	Non Poor	Poor	All
	1990/91*								
Agriculture	7.11	14.09	8.54	56.50	66.72	59.47	30.44	45.07	34.06
Industry	34.07	32.70	33.79	13.11	9.04	11.92	24.17	18.77	22.83
Production Services	29.68	30.05	29.75	11.60	9.13	10.88	21.14	17.73	20.29
Social Services	29.14	23.17	27.92	18.80	15.11	17.73	24.26	18.43	22.81
Total	100	100	100	100	100	100	100	100	100
	1995-96								
Agriculture	5.58	8.34	5.90	46.01	56.23	48.59	29.72	46.27	33.08
Industry	30.91	40.59	32.04	15.57	14.37	15.27	21.76	19.82	21.36
Production Services	34.24	25.22	33.19	14.35	11.13	13.53	22.36	14.06	20.68
Social Services	29.26	25.84	28.87	24.07	18.28	22.61	26.16	19.85	24.88
Total	100	100	100	100.00	100.00	100.00	100	100	100
	1999-2000								
Agriculture	5.93	14.15	6.71	43.32	54.06	45.72	27.77	45.83	30.93
Industry	29.18	26.56	28.93	16.69	13.87	16.06	21.88	16.49	20.94
Production Services	34.24	31.50	33.97	15.77	12.43	15.02	23.45	16.36	22.21
Social Services	30.66	27.7	30.3	24.22	19.65	23.19	26.90	21.3	25.9

		9	8					3	2
Total	100	100	100	100	100	100	100	100	100
	2004-2005								
Agriculture	5.80	15.20	6.74	41.11	50.99	43.78	25.15	43.88	28.93
Industry	29.38	30.55	29.49	17.12	15.37	16.65	22.66	18.38	21.80
Production Services	36.22	31.05	35.71	16.70	13.09	15.73	25.52	16.66	23.74
Social Services	28.60	23.20	28.06	25.06	20.55	23.85	26.66	21.08	25.54
Total	100	100	100	100	100	100	100	100	100

*In the 1990/91 HIEC survey, economic activities are available for heads of households rather than individuals, unlike for the three subsequent surveys. For comparison purposes, figures in this table have been estimated by economic activities of heads of households, which differ from those based on economic activities of individuals available only for the three HIECS for 1995/96, 1999/00 and 2004/05.

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